

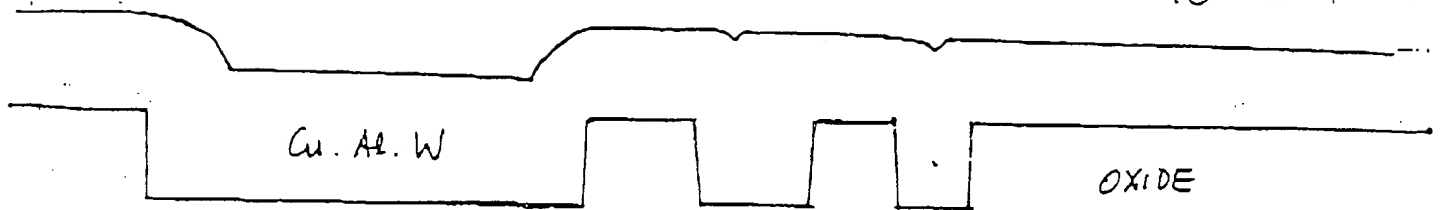
Exhibit 3

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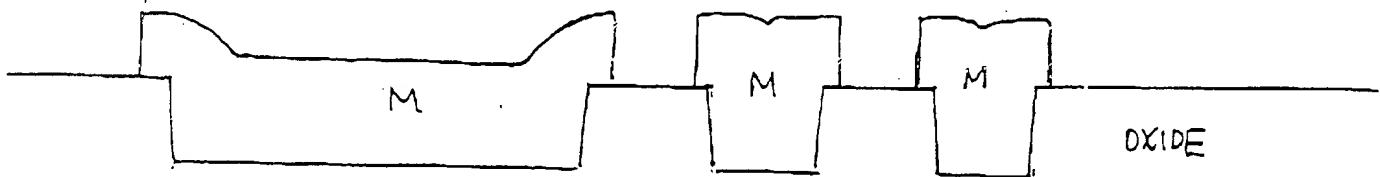
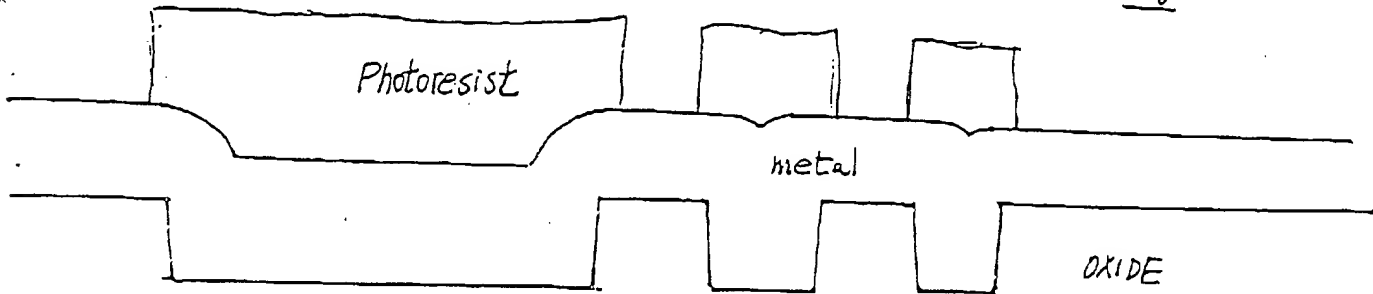
TSMC INVENTION DISCLOSURE			PAGE 1 OF 1		TSMC CONFIDENTIAL (WHEN COMPLETED)	
FULL NAME(S) OF INVENTOR(S)		EMPLOY EE NO.	DEPT	DEPT CODE	TEL. NO.	FOR USE BY INTELLECTUAL PROPERTY LAW
ENGLISH	CHINESE					DISCLOSURE NO.
SMJang	章勵明	933816	TFDM	233/0	3458	TSMC-1-98-021
						RECEIVED DATE (TIME STAMP)
<p>TITLE OF INVENTION --</p> <p>Method of Forming Al or Cu Damascene Structure</p>						
<p>BACKGROUND INFORMATION -- CURRENT PRACTICE AND DISADVANTAGES</p> <p>The use of Cu or Al damascene process is becoming important. After metal filling, CMP is used to planarize the metal lines. For damascene process, complete removal of metal film on oxide with minimized dishing over large trench presents a great challenge.</p>						
<p>MAIN POINTS OF CLAIM (PLEASE LIST ITEM BY ITEM)</p> <ol style="list-style-type: none"> <li>1. A reverse-tone mask of metal line is implemented to removed redundant Al or Cu to facilitate CMP.</li> <li>2. The removal of Al or Cu can be dry or wet process.</li> </ol>						
<p>PROBLEM SOLVED OR IMPROVEMENTS OBTAINED BY THIS INVENTION (PLEASE LIST ITEM BY ITEM)</p> <ol style="list-style-type: none"> <li>1. Metal on oxide can be polished off easily which reduces the overpolish time.</li> <li>2. Dishing of wide metal line or pad is reduced.</li> </ol>						
<p>KEYWORD SEARCH FOR PATENT/LITERATURES</p> <p>damascene</p>						
<p>PATENT/LITERATURES SEARCH RESULT (PLEASE SPECIFY SIMILAR PATENT NO. AND LITERATURE CITATION)</p> <p>Patent: US 4,789,648, US 4,702,792, US 4,954,459</p>						
<p>DETAILED DESCRIPTION OF INVENTION -- (CONTINUED NEXT PAGE)</p> <p>Damascene is becoming important for future interconnection. One major problem associated with the formation of damascene is CMP. During CMP, the complete removal of metal film on oxide is difficult. Although Cu or Al on oxide can be cleared out by overpolishing, dishing appears. Moreover, erosion of dense metal lines may occur too. Thus, in this patent disclosure, we propose to use a mask reverse to metal lines which allows to remove the redundant Al or Cu on oxide. When Al or Cu on oxide is etched off by dry or wet process, the margin of CMP process becomes improved because overpolish is not critical. Furthermore, the reduction of overpolishing also decrease erosion and dishing which improves metal continuity and reliability and subsequent photo processing.</p>						
<p>WITNESSES : THE TWO WITNESSES WHOSE SIGNATURES APPEAR BELOW HAVE READ AND UNDERSTAND THIS ENTIRE INVENTION DISCLOSURE.</p>			<p>DISCLOSURE SUBMITTED BY</p>			
<p>SIGNATURE OF WITNESS</p> <p>DATE</p> <p>章勵明</p>			<p>INVENTOR'S SIGNATURE</p> <p>DATE</p> <p>章勵明</p>		<p>INVENTOR'S SIGNATURE</p> <p>DATE</p>	
<p>SIGNATURE OF WITNESS</p> <p>DATE</p> <p>章勵明</p>			<p>INVENTOR'S SIGNATURE</p> <p>DATE</p>		<p>INVENTOR'S SIGNATURE</p> <p>DATE</p>	

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APPROACH 1 : Reverse-tone mask of metal line +  $\text{Cl}_2$   $\text{HNO}_3$  dry/wet etch.



APPROACH 2 : RELAXED Reverse-tone mask of metal line + dry/wet etch

- open PR on LARGE field oxide
- Photo/etch not critical

